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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/694,873	10/28/2003	John G. Heston	004578.1377	4101

7590 09/25/2006

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EXAMINER

SANDVIK, BENJAMIN P

ART UNIT	PAPER NUMBER
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2826

DATE MAILED: 09/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/694,873	HESTON, JOHN G.	
	Examiner	Art Unit	
	Ben P. Sandvik	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-19 and 21-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-5, 7-19 and 21-24 is/are allowed.
- 6) ☒ Claim(s) 25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments, filed 6/29/2006, with respect to claims 1 and 15 have been fully considered and are persuasive. The rejection of claims 1 and 15 has been withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiraishi et al (U.S. PG Pub #2001/0002727), in view of Perino et al (U.S. Patent #6621155), further in view of Goossen (US Patent #5975408).

With respect to **claim 25**, Shiraishi teaches a circuit having first (Fig. 4, 105), second (Fig. 4, 101), and third circuit portions (Fig. 4, 103), said first and third circuit portions each including at least one semiconductor circuit component, said second circuit portion having first and second electrically conductive parts (Fig. 4, solder balls under 101); a first substrate with said first circuit portion disposed adjacent one side thereof (Fig. 4, substrate of chip 105), said first substrate having a semiconductor portion which has each said semiconductor

circuit component of said first circuit portion therein; an insulating layer overlying the first circuit portion (Fig. 4, insulating layer of multi-layer board 107); at least one via disposed within the insulating layer and electrically coupling the first circuit portion to the second circuit portion (Fig. 4, 109); and a second substrate with said third circuit portion disposed adjacent one side thereof said second substrate being physically separate from said first substrate and being oriented so that said one side thereof faces said one side of said first substrate, and said second substrate having a semiconductor portion which has each said semiconductor circuit component of said third circuit portion therein (Fig. 4, substrate of chip 103). Shiraishi does not teach that said second circuit portion includes at least one passive component selected from the group consisting of a resistor, a capacitor, and an inductor, and being free of semiconductor circuit components; and said third circuit portion having third and fourth electrically conductive parts which are respectively coupled to said first and second electrically conductive parts by respective thermo-formed bonds. Perino teaches a circuit portion (Fig. 9, 950) having passive components (Fig. 9, 940a-c) electrically coupled to a semiconductor die; the circuit portion having first and second conductive parts (Fig. 9, bond pads for passive components 940a, 940b) and being coupled to third and fourth conductive parts of the chip (Fig. 9, bond pads connected to passive components 940a, 940b). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the chip 103 of Shiraishi with a second circuit portion as taught by Perino

in order to terminated transmission lines on the chip stack. Furthermore, Shiraishi does not teach that the thermo formed bonds are thermosonic and thermocompression bonds. Goossen teaches solder bonds that are formed by thermocompression bonding (Col 1 Ln 66 to Col 2 Ln 5). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the solder bonds of Shiraishi as taught by Goossen in order to form a secure bond in a polymer underfill.

Allowable Subject Matter

Claims 1-5, 7-19, and 21-24 are allowed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben P. Sandvik whose telephone number is (571) 272-8446. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

bps



EVAN PERT
PRIMARY EXAMINER